

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 09-083952

(43)Date of publication of application : 28.03.1997

(51)Int.Cl.

H04N 5/92

H04N 5/232

H04N 5/765

H04N 5/937

(21)Application number : 07-259541

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(22)Date of filing : 13.09.1995

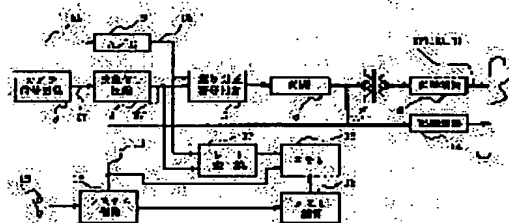
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(54) IMAGE PICKUP DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To record an image pickup result without missing an important recording opportunity by recording the image pickup result in a loop on a storage means in a stand-by state, starting the recording of the image pickup result on a recording medium when the stand-by state is released and finishing recording to the storage means at the same time.

SOLUTION: A camcorder VTR 1 is set to the stand-by mode, a system control circuit 13 sets a memory control circuit 18 to the stand-by state, sets a digital video signal DV1 and a digital audio signal DA to be the stand-by mode to record these signals in a memory 16 successively and in a loop. When a camera man operates a recording button 15, the system control circuit 13 switches the operation mode of the whole of VTR 1 to be a recording mode to successively record the digital video signal DV1 and the digital audio signal DA, which are inputted, on a magnetic tape 2 and to stop the recording of these signals in the memory 16.



LEGAL STATUS

[Date of request for examination]

05.07.2002

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

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CLAIMS

[Claim(s)]

[Claim 1] The image pick-up equipment carries out ending record of the aforementioned image pick-up result to the aforementioned storage means as the feature while starting record of the aforementioned image pick-up result to the aforementioned record medium, if the aforementioned image pick-up result is cyclically recorded one by one to a regular storage means and the aforementioned standby state is canceled in a standby state in the image pick-up equipment recorded to the record medium of a convention of an image pick-up result.

[Claim 2] It is image pick-up equipment according to claim 1 which the aforementioned record medium becomes by the magnetic tape, the aforementioned storage means is held possible [exchange], and the aforementioned image pick-up equipment carries out the data compression of the aforementioned image pick-up result, and is characterized by what is recorded on the aforementioned storage means with an audio signal.

[Claim 3] The aforementioned image pick-up equipment is image pick-up equipment according to claim 1 characterized by enabling it to reproduce the image pick-up result which records a recognition signal on the aforementioned storage means and the aforementioned record medium, and corresponds to them on the basis of the aforementioned recognition signal with the aforementioned image pick-up result from the aforementioned storage means and the aforementioned record medium.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention avoids degradation of mobility effectively, and it enables it to record it by holding the image pick-up result of convention time just before recording an image pick-up result on a regular storage means cyclically one by one and starting record of an image pick-up result to a record medium in a camera one apparatus video tape recorder, concerning image pick-up equipment for this storage means, without missing the opportunity of precious photography.

[0002]

[Description of the Prior Art] It is made as [use / the image which carried in the coverage site, and recorded and recorded various images / in the camera one apparatus video tape recorder which becomes with this kind of image pick-up equipment / conventionally / for a news program etc. / according to the so-called autocratic operation being possible].

[0003]

[Problem(s) to be Solved by the Invention] By the way, in such a coverage site, if it holds and stands by in the standby state and the opportunity of coverage visits the mode of operation of a camera one apparatus video tape recorder, by pressing *****, a cameraman will switch the mode of operation of a camera one apparatus video tape recorder to videotape-recording mode, and, thereby, will record various images.

[0004] Therefore, by the conventional camera one apparatus video tape recorder, when sudden change of the situation in which a cameraman cannot predict etc. occurred, even if it pressed ***** immediately, there was a case where the opportunity of decisive image videotape recording was lost.

[0005] Although the method of always holding a camera one apparatus video tape recorder in the videotape-recording state is also considered when sudden change of such a situation is predicted in advance, now, the consumption of a magnetic tape and a battery becomes huge and there is a problem by which the mobility of a camera one apparatus video tape recorder is spoiled. Moreover, although how to connect a video tape recorder separately and always record a video signal is also considered, there is a problem by which the mobility of a camera one apparatus video tape recorder is spoiled also in this case.

[0006] On the other hand, although how to delay an image pick-up result through external memory separately in such a case, and record on it at a magnetic tape is also considered, there are a part which connected external memory also in this case, and a problem by which the mobility of a camera one apparatus video tape recorder is spoiled.

[0007] this invention tended to be made in consideration of the above point, tends to avoid effectively degradation of the mobility of a camera one apparatus video tape recorder, and tends to propose the image pick-up equipment which can be recorded without missing a precious motion picture camera meeting.

[0008]

[Means for Solving the Problem] In order to solve this technical problem, in this invention, it applies to the image pick-up equipment which records an image pick-up result on a regular record medium. If a previous image pick-up result is cyclically recorded on a regular storage means one by one and this standby state is canceled, while starting record of an image pick-up result to a record medium in a standby state here, record of the image pick-up result to a previous storage means is ended.

[0009] Moreover, a previous record medium becomes by the magnetic tape, and a previous storage means is held possible [exchange], and previous image pick-up equipment carries out the data compression of the image pick-up result, and it is made to record on a previous storage means with an audio signal at this time.

[0010] Furthermore it replaces with this, and image pick-up equipment records a recognition signal on a previous storage means and a previous record medium with a previous image pick-up result, and enables it to reproduce the image pick-up result which corresponds on the basis of this recognition signal from a storage means and a record medium.

[0011] If an image pick-up result is cyclically recorded on a regular storage means one by one, this standby state is canceled in a standby state by these means and record of the image pick-up result to a previous storage means will be ended while starting record of an image pick-up result to a previous record medium, the image pick-up result of a convention period just before starting record of an image pick-up result to a record medium can be held to this storage means.

[0012] Moreover, if a previous record medium becomes by the magnetic tape, a previous storage means is held possible [exchange], previous image pick-up equipment carries out the data compression of the image pick-up result and it memorizes for a previous storage means with an audio signal, it is applicable to a camera one apparatus video tape recorder.

[0013] Furthermore, a recognition signal is recorded on a previous storage means and a previous record medium with a previous image pick-up result, and if it enables it to reproduce the image pick-up result which corresponds on the basis of this recognition signal from a storage means and a record medium, in an editing task etc., a corresponding image pick-up result is simply reproducible.

[0014]

[Embodiments of the Invention] Hereafter, the form of operation of this invention is explained in full detail, referring to a drawing suitably.

[0015] Drawing 1 is the block diagram showing the recording system of the camera one apparatus video tape recorder

concerning the form of operation of the 1st of this invention, and records the video signal SV which pictures a desired photographic subject and is acquired on a magnetic tape 2 in this camera one apparatus video tape recorder 1.

[0016] That is, in this camera one apparatus video tape recorder 1, the camera digital disposal circuit 3 carries out signal processing of the output signal of the CCD solid state image pickup device which is not illustrated, and outputs video signal DV which comes to be as a result of an image pick-up in the form of a digital signal. The data compression of this video signal DV is carried out by the regular data compression technique, and the continuing video signal compression circuit 4 outputs it here — this data compression technique — MPEG (Moving Picture Experts Group) — the analogous data compression technique — it is — the same hierarchy composition as MPEG — and the amount of data is reduced by the technique of a motion compensation, quantization, and variable length coding.

[0017] As this shows drawing 2, the video-signal compression circuit 4 changes into 4 [bit] and digital video signal DV1 of 6.75 [MHz] 10 [bit] and video signal DV of 27 [MHz] which are obtained from the camera digital disposal circuit 3, and reduces and outputs the amount of data to abbreviation 1/10. In addition, the video-signal compression circuit 4 makes a unit GOP (Group Of Picture) which becomes by one of the hierarchy composition of this kind of the data compression technique, carries out a data compression, and thereby, by the camera one apparatus video tape recorder 1, even if it reproduces digital video signal DV1 at random, it is made as [reproduce / the original digital video signal DV].

[0018] The error correcting code addition circuit 5 is outputted in order of a convention, after adding an error correcting code to this digital video signal DV1 per regular block. A modulation circuit 6 carries out coding processing of the output data of this error correcting code addition circuit 5 with the coding method suitable for record of a magnetic tape 2, and outputs them in the form of serial data. The rotary transformer 7 transmits the output data of this modulation circuit 6 to the record amplifying circuit 8 recorded by the rotating drum, this record amplifying circuit 8 drives the magnetic head which is not illustrated following the output data of this rotary transformer 7, and forms a recording track in a magnetic tape 2 slant one by one by this, and records digital video signal DV.

[0019] At this time, between the regular periods during the period which scans a magnetic tape slant, this video signal DV is recorded, and the corresponding magnetic head divides the field where a recording track remains, and records audio signal SA and index signal ID at the camera one apparatus video tape recorder 1, respectively.

[0020] That is, in the camera one apparatus video tape recorder 1, the analog-to-digital-conversion circuit (A/D) 9 carries out analog-to-digital-conversion processing of the audio signal inputted through a microphone etc., and generates digital audio signal DA. The error correcting code addition circuit 5 is outputted in order of a convention, after adding an error correcting code to this digital audio signal DA per regular block in addition to digital video signal DV1. In addition to digital video signal DV1, a modulation circuit 6 carries out coding processing, and outputs this digital audio signal DA in the form of serial data.

[0021] At this time, a modulation circuit 6 outputs this serial data to regular timing on the basis of the timing of a scan of the magnetic head, thereby, by the camera one apparatus video tape recorder 1, divides a recording track and records audio signal SA and a video signal SV.

[0022] Furthermore, in this camera one apparatus video tape recorder 1, through the modulation circuit which is not illustrated, the rotary transformer 7 receives to the timing of a convention of index signal ID outputted from the system control circuit 13, is replaced with audio signal SA and a video signal SV to regular timing, and carries out slanting record of this index signal ID at a magnetic tape 2.

[0023] On the other hand, by driving the regular fixed head according to index signal ID, the record amplifying circuit 14 forms the recording track extended to the longitudinal direction of a magnetic tape 2, and records index signal ID on this recording track.

[0024] In this camera one apparatus video tape recorder 1, this index signal ID is outputted following press operation of ***** 15, and whenever photography of one scene is completed, it is generated by the system control circuit 13 here so that an increment may be carried out. That is, in this kind of camera one apparatus video tape recorder 1, press operation of ***** 15 is repeated, it is used so that the material of number 100 cut may be recorded on one magnetic tape from a number cut, and it is made as [perform / an editing task] by rerecording each material alternatively if needed. Thereby, it is formed so that processing of search of each material etc. can be performed on the basis of this index signal ID in the camera one apparatus video tape recorder 1 at the time of edit, and it is made as [improve / the efficiency of an editing task / by this].

[0025] In addition to the recording system of video signal DV to such a magnetic tape 2, and audio signal SA, the camera one apparatus video tape recorder 1 holds video signal DV and audio signal SA just before starting record to a magnetic tape 2 in memory 16.

[0026] That is, in the camera one apparatus video tape recorder 1, the rate conversion circuit 17 is received in 4 [bit] and digital video signal DV1 of 6.75 [MHz] which are outputted from the video-signal compression circuit 4, and is changed and outputted to 16 [bit] and the digital video signal of 1.6875 [MHz] (drawing 2). Moreover, the rate conversion circuit 17 receives digital audio signal DA outputted from the analog-to-digital-conversion circuit 9, and changes and outputs it to the data of 16 bit parallel similarly. Thereby by the camera one apparatus video tape recorder 1, it is made as [record / digital video signal DV1 and digital audio signal DA / efficiently].

[0027] It is formed in this camera one apparatus video tape recorder 1 by the memory card held free [attachment and detachment], address control is carried out by the memory control circuit 18, and memory 16 records digital video signal DV1, digital audio signal DA, and index signal ID. That is, as shown in drawing 3, this memory 16 divides room into SA and a data area.

[0028] Memory 16 divides this data area into two or more record sections AR0, AR1, and AR2 and further, and holds digital video signal DV1 and digital audio signal DA just before starting record of each material to each fields AR0, AR1, and AR2 and ... corresponding to each material recorded on the magnetic tape 2. In the mode of operation of standby, operation of this record will be stopped and record of this digital video signal DV1 and digital audio signal DA will be performed here, if digital video signal DV1 and digital audio signal DA are recorded to one cyclically [these record sections AR0, AR1, and AR2 and] on by one and ***** 15 is pressed according to the address data published by the memory control circuit 18, as Arrow shows.

[0029] As this shows drawing 4, in the camera one apparatus video tape recorder 1 About digital video signal DV1 (drawing 4 (A)) outputted one by one per [circuit / video-signal compression / 4] GOP this digital video signal DV1 — memory 16 — on by one — cyclic — recording (drawing 4 (B)) — Tim — if press operation of ***** 15 is carried out by 1, record in memory 16 will be stopped and GOP continuing digital video signal DV1 will be recorded on a

magnetic tape 2 (drawing 4 (C)) In practice, in the gestalt of this operation, room is secured and the record sections AR0, AR1, and AR2 and are formed so that digital video signal DV1 and digital audio signal DA for several seconds to number 10 seconds can be recorded, and thereby, they are made by the camera one apparatus video tape recorder 1 as [record / digital video signal DV1 and digital audio signal DA for several seconds to number 10 seconds just before pressing ***** 15 and starting videotape recording].

[0030] On the other hand, memory 16 records administrative data in SA, and records a correspondence relation with a magnetic tape 2 to this administrative data. Furthermore, memory 16 divides the record sections AR0, AR1, and AR2 of a data area, and the SA which continues corresponding to The record sections AR0, AR1, and AR2 corresponding to the divided each field, the address data which specify (AR0, AR1, AR2, ...). Corresponding index signals ID0, ID1, and ID2, corresponding Each record sections AR0, AR1, and AR2, address data ADm+1 of which specify the head record position of digital video signal DV1 and digital audio signal DA, ADn+1, ADn+1, and .. are recorded.

[0031] it writes — in carrying out, the memory control circuit 18 is controlled by the system control circuit 13, it switches operation, publishes address data etc. in memory 16, and controls operation of memory 16 The system control circuit 13 is formed with the microcomputer which controls operation of this camera one apparatus video tape recorder 1 whole.

[0032] That is, if this camera one apparatus video tape recorder 1 is loaded with a magnetic tape 2 and memory 16 and this camera one apparatus video tape recorder 1 is set as a standby mode, the system control circuit 13 will control the memory control circuit 18, will rewrite the administrative data of memory 16 by the volume data of a magnetic tape 2, and, thereby, will record a correspondence relation with a magnetic tape 2 on memory 16.

[0033] Furthermore, the system control circuit 13 sets the memory control circuit 18 to a standby mode in this state, and records cyclically digital video signal DV1 and digital audio signal DA on the 1st record section AR0 one by one. If a cameraman does press operation of ***** 15 in this state, the system control circuit 13 switches the mode of operation of this camera one apparatus video tape recorder 1 whole to a recording mode, and while recording digital video signal DV1 and digital audio signal DA which are inputted one by one on a magnetic tape 2, record of digital video signal DV1 to memory 16 and digital audio signal DA will be stopped.

[0034] As opposed to the address data ADm (drawing 3) with which the memory control circuit 18 stopped record of digital video signal DV1 and digital audio signal DA corresponding to this Only a value 1 adds an address value and it is address data ADm+1 (namely, it becomes by the address data of the memory 16 which suited just before starting the continuing record), the address data by which oldest video signal DV1 and audio signal DA were recorded in this record section AR0 — becoming — it generates and this address data ADm+1 is recorded on corresponding SA Moreover, index signal ID0 simultaneously outputted from the system control circuit 13 is recorded on this corresponding SA, and the continuing standby state is awaited.

[0035] If the system control circuit 13 starts record to a magnetic tape 2 corresponding to this Output this index signal ID to memory 16, and output this index signal ID to the record amplifying circuit 14 and the rotary transformer 7, and this uses an index signal effectively. The correspondence relation between digital video signal DV1 and digital audio signal DA which were recorded on memory 16, and digital video signal DV1 and digital audio signal DA which are continuously recorded on a magnetic tape 2 is recorded on a magnetic tape 2 and memory 16.

[0036] Furthermore, the system control circuit 13 starts record of digital video signal DV1 and digital audio signal DA to the record section AR1 where memory 16 continues while stopping record to a magnetic tape 2, if a cameraman presses ***** 15 again in this state and the mode of operation of the camera one apparatus video tape recorder 1 is set to a standby mode. It can record without only regular time's just before starting record to a magnetic tape 2 being able to hold an image pick-up result in memory 16, avoiding degradation of mobility effectively, and missing the opportunity of precious photography in the camera one apparatus video tape recorder 1, by this. by furthermore having clarified correspondence relation between a magnetic tape 2 and memory 16 on the basis of index signal ID at this time, it is reproducing continuously digital video signal DV1 and digital audio signal DA which correspond on the basis of this index signal ID in the work of edit etc. — it can do — the part — processing of an editing task etc. can be performed efficiently

[0037] That is, drawing 5 is the block diagram showing the video tape recorder of an edit system which edits the magnetic tape 2 recorded by this camera one apparatus video tape recorder 1. This edit system is reproduced by the video tape recorder 20, rerecords digital video signal DV1 and digital audio signal DA which were recorded on a magnetic tape 2 and the memory 16 corresponding to this magnetic tape 2 on other video tape recorders, and edits digital video signal DV1 and digital audio signal DA by other video tape recorders.

[0038] That is, in this video tape recorder 20, the reproduction amplifying circuit 21 is recorded by the rotating drum, amplifies the regenerative signal obtained from the magnetic head, and outputs it to the rotary transformer 22, and the rotary transformer 22 outputs this regenerative signal to a demodulator circuit 24.

[0039] A demodulator circuit 24 incorporates and makes this regenerative signal binary to regular timing, and decodes and outputs the serial data obtained as a result. The continuing error correction circuit 28 carries out error correction processing of the output data of this demodulator circuit 24, and, thereby, reproduces and outputs digital audio signal DA and digital video signal DV1. The digital-to-analog-conversion circuit (D/A) 27 carries out digital-to-analog-conversion processing of the digital audio signal DA inputted one by one, and, thereby, reproduces and outputs the original audio signal SA.

[0040] On the other hand, the video-signal extension circuit 29 carries out data extension of digital video signal DV1 inputted one by one, and, thereby, reproduces and outputs digital video signal DV.

[0041] The reproduction amplifying circuit 30 amplifies and outputs the regenerative signal of the magnetic tape 2 obtained from the fixed head. A demodulator circuit 31 incorporates and makes binary the regenerative signal outputted from this reproduction amplifying circuit 30, and, thereby, reproduces and outputs index signal ID. Moreover, the reproduction amplifying circuit 30 incorporates and makes binary the regenerative signal outputted from the rotary transformer 22 to regular timing, and, thereby, reproduces and outputs index signal ID which carried out slanting record to a magnetic tape 2.

[0042] Thereby, by the video tape recorder 20, when carrying out edit processing per search and recording track quickly by index signal ID recorded on the longitudinal direction of a magnetic tape 2 when the head of a magnetic tape 2 was pulled out by a rapid traverse, winding, etc., it is made as [process / certainly / a magnetic tape 2 / by index signal ID which carried out slanting record / it].

[0043] In addition to the reversion system to this magnetic tape 2, in a video tape recorder 20, the rate conversion circuit 32 changes and outputs the digital video signal and digital audio signal of 16 bit parallel which are outputted from memory 16 to the data of the original bit parallel at the time of reproduction. The memory control circuit 33 outputs address data to memory 16, and controls operation of memory 16.

[0044] Index signal ID which the system control circuit 34 was formed with the microcomputer which controls operation of this video tape recorder 20 whole, and was read from memory 16. It is based on index signal ID reproduced from the magnetic tape 2. By outputting digital video signal DV1 and digital audio signal DA to the video-signal extension circuit 29 and the digital-to-analog conversion circuit 27 on by on from memory 16 and a magnetic tape 2, a correspondence relation is specified by index signal ID, and digital video signal DV1 and digital audio signal DA which were divided and recorded on memory 16 and the magnetic tape 2 are reproduced continuously.

[0045] That is, first, the head record position of the 1st record section AR 0 address-data-AD(s) the system control circuit 34 from the SA of memory 16, and it reads corresponding index signal ID. Then, after the system control circuit 34 pulls out the head of a magnetic tape 2 to the record starting position corresponding to a rapid traverse, rewinding, and the 1st record section AR 0 for a magnetic tape 2, carrying out the monitor of index signal ID obtained from the reproduction amplifying circuit 30, it suspends a run of a magnetic tape 2 and holds it in the reproduction standby state.

[0046] Then, the system control circuit 34 outputs this address data AD to the memory control circuit 33 with the command of read-out. Following this, from the record starting position specified by this address data AD, the memory control circuit 33 publishes address data one by one, reads digital video signal DV1 and digital audio signal DA, and outputs these read signals DV1 and DA to the video-signal extension circuit 29 and the digital-to-analog-conversion circuit 27 from memory 16. This outputs digital video signal DV1 and digital audio signal DA which were recorded on memory 16 to the video tape recorder for dubbing in a video tape recorder 20.

[0047] The system control circuit 34 will control the whole operation by this state to cancel the standby state of a magnetic tape 2 and to start reproduction of a magnetic tape 2, if the monitor of the operation of the memory control circuit 33 is carried out and the memory control circuit 33 stops read-out operation in the address in front of the address data AD. This outputs continuing digital video signal DV1 and digital audio signal DA to the video tape recorder for dubbing in a video tape recorder 20 following digital video signal DV1 and digital audio signal DA which were recorded just before pressing ***** 15.

[0048] The system control circuit 34 loads index signal ID of the record section AR 1 which continues from the SA of memory 16, and the record starting address data AD in this state, if it becomes the record starting position of the material which continues in a magnetic tape 2, a magnetic tape 2 will be switched to a reproduction standby state, and digital video signal DV1 and digital audio signal DA which continue from memory 16 on the basis of this record starting address data AD will be read. Thereby, by the video tape recorder 20, this the processing of a series of is repeated, and after rerecording separately digital video signal DV1 and digital audio signal DA which were recorded on a magnetic tape 2 and memory 16 on a magnetic tape, it is made as [perform / an editing task / by the same procedure as usual].

[0049] digital video signal DV which will picturize a photographic subject and will be obtained in the camera one apparatus video tape recorder 1 (drawing 1) in the above composition if a cameraman sets to a standby state — the video-signal compression circuit 4 — setting — about — after being compressed into 1/10 of the amounts of data; it is inputted into the rate conversion circuit 17 with digital audio signal DA, and is changed into the data of 16 bit parallel. The data of these 16 bit parallel are cyclically recorded on the record section of the convention formed in the data area of memory 16 one by one, and, thereby, newest digital video signal DV1 and newest digital audio signal DA are held in this record section at a part for the room of this record section, and a usual state.

[0050] If a cameraman does press operation of ***** 15 in this state, halt control of the writing of digital video signal DV1 to memory 16 and digital audio signal DA will be carried out, and digital video signal DV1 and digital audio signal DA just before this presses ***** 15 will be held at memory 16. Record by the magnetic tape 2 is started simultaneously, and slanting record of digital video signal DV1 and the digital audio signal DA is carried out at a magnetic tape 2 through the error correcting code addition circuit 5, a modulation circuit 6, the rotary transformer 7, and the record amplifying circuit 8.

[0051] It can record without being able to picturize a series of photographic subjects and missing a precious motion picture camera meeting from a convention period just before digital video signal DV1 and digital audio signal DA after this presses ***** 15 are recorded on a magnetic tape 2 and press ***** 15 by memory 16 and the magnetic tape 2.

[0052] At this time, index signal ID is outputted by the system control circuit 13, and the address data AD of a record end position to the head record position of memory 16 are generated in the system control circuit 13. The address data AD and index signal ID of this head record position are recorded on the SA of memory 16, and this index signal ID is recorded on the recording track and slanting recording track which the recording start position of a magnetic tape 2 and a longitudinal direction extend. The relation of a magnetic tape 2 and the content of record of memory 16 is recorded on memory 16 and a magnetic tape 2 by this, and the reproduction starting position of memory 16 is recorded on the SA of memory 16.

[0053] After this reproduces digital video signal DV1 and digital audio signal DA from the head record position recorded on memory 16 at the time of reproduction, digital video signal DV1 and digital audio signal DA which correspond on the basis of index signal ID continuously can be reproduced from a magnetic tape 2, and a series of contents divided and recorded on a magnetic tape 2 and memory 16 can be reproduced in order of record.

[0054] If according to the above composition digital video signal DV1 and digital audio signal DA are cyclically recorded on memory 16 one by one and ***** 15 is pressed in a standby state, while stopping record of memory 16, it can leave records about digital video signal DV1 and digital audio signal DA just before pressing ***** 15 by recording digital video signal DV1 and digital audio signal DA on a magnetic tape 2. Only by this recording memory card, a photographic subject can be picturized without missing the opportunity of precious photography, and degradation of the mobility of the part camera one apparatus video tape recorder can be avoided effectively.

[0055] Even when press operation of ***** 15 is repeated and many materials are recorded on a magnetic tape 2 by having recorded the index signal at this time, and having associated and recorded the content of memory 16 and a magnetic tape 2, digital video signal DV1 and digital audio signal DA which correspond from memory 16 can be certainly reproduced to the material recorded on this magnetic tape 2.

[0056] In addition, although the case where rerecorded digital video signal DV1 and digital audio signal DA by other video tape recorders, and they were described, you may make it record this invention not only on this but on a hard disk drive unit, an optical disk unit, etc. in an edit system in the gestalt of above-mentioned operation. Moreover, you may carry out direct edit processing on the basis of the index signal recorded on the content of SA, and the magnetic tape in these cases.

[0057] Moreover, in the gestalt of above-mentioned operation, although the case where the same index signal was recorded by the magnetic tape 2 and memory 16 was described, this invention may record not only this but an index signal which can apply various recognition signals if a correspondence relation can be grasped about a magnetic tape 2 and the content of record of memory 16 in short, for example, is different by the magnetic tape 2 and memory 16. Moreover, it replaces with an index signal, the content of the SA corresponding to a magnetic tape side is recorded, and it is good also as a recognition signal.

[0058] Furthermore, although the case where an image pick-up result was recorded on a magnetic tape and memory card in the gestalt of above-mentioned operation was described, this invention can also record an image pick-up result on a magnetic tape 2 collectively by summarizing the content of memory 16 to the convention field of a magnetic tape 2, and rerecording it in advance of the unloading of not only this but a magnetic tape.

[0059] Moreover, in the gestalt of above-mentioned operation, although the case where a magnetic tape was used as a record medium was described, this invention can be widely applied, when using a magnetic disk as a record medium, using an optical disk further and recording a video signal using various record media not only this but. In addition, when using record media, such as these magnetic disks, it may replace with memory 16 and the convention field of these record media may be used.

[0060]

[Effect of the Invention] If an image pick-up result is cyclically recorded on a regular storage means one by one and this standby state is canceled, while starting record of an image pick-up result to a record medium in a standby state as mentioned above according to this invention. Only by establishing this storage means by ending record of the image pick-up result to a previous storage means, if this standby state is canceled, the image pick-up result of the last convention period can be held for this storage means. This avoids effectively degradation of the mobility of this kind of image pick-up equipment, and it can record, without missing the opportunity of precious photography.

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention avoids degradation of mobility effectively, and it enables it to record it by holding the image pick-up result of convention time just before recording an image pick-up result on a regular storage means cyclically one by one and starting record of an image pick-up result to a record medium in a camera one apparatus video tape recorder, concerning image pick-up equipment for this storage means, without missing the opportunity of precious photography.

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PRIOR ART

[Description of the Prior Art] It is made as [use / the image which carried in the coverage site, and recorded and recorded various images / in the camera one apparatus video tape recorder which becomes with this kind of image pick-up equipment / conventionally / for a news program etc. / according to the so-called automatic operation being possible].

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EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, by this invention, in a standby state, if an image pick-up result is cyclically recorded on a regular storage means one by one and this standby state is canceled, while starting record of an image pick-up result to a record medium, record of the image pick-up result to a previous storage means is ended. Therefore, only by establishing this storage means, if this standby state is canceled, the image pick-up result of the last convention period can be held for this storage means. This avoids effectively degradation of the mobility of this kind of image pick-up equipment, and it can record, without missing the opportunity of precious photography.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, in such a coverage site, if it holds and stands by in the standby state and the opportunity of coverage visits the mode of operation of a camera one apparatus video tape recorder, by pressing *****, a cameraman will switch the mode of operation of a camera one apparatus video tape recorder to videotape-recording mode, and, thereby, will record various images.

[0004] Therefore, by the conventional camera one apparatus video tape recorder, when sudden change of the situation which a cameraman cannot predict etc. occurred, even if it pressed ***** immediately, there was a case where the opportunity of decisive image videotape recording was lost.

[0005] Although the method of always holding a camera one apparatus video tape recorder in the videotape-recording state is also considered when sudden change of such a situation is predicted in advance, now, the consumption of a magnetic tape and a battery becomes huge and there is a problem by which the mobility of a camera one apparatus video tape recorder is spoiled. Moreover, although how to connect a video tape recorder separately and always record a video signal is also considered, there is a problem by which the mobility of a camera one apparatus video tape recorder is spoiled also in this case.

[0006] On the other hand, although how to delay an image pick-up result through external memory separately in such a case, and record on it at a magnetic tape is also considered, there are a part which connected external memory also in this case, and a problem by which the mobility of a camera one apparatus video tape recorder is spoiled.

[0007] this invention tended to be made in consideration of the above point, tends to avoid effectively degradation of the mobility of a camera one apparatus video tape recorder, and tends to propose the image pick-up equipment which can be recorded without missing a precious motion picture camera meeting.

[Translation done.]

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MEANS

[Means for Solving the Problem] In order to solve this technical problem, in this invention, it applies to the image pck-up equipment which records an image pck-up result on a regular record medium. If a previous image pck-up result is cyclically recorded on a regular storage means one by one and this standby state is canceled, while starting record of an image pck-up result to a record medium in a standby state here, record of the image pck-up result to a previous storage means is ended.

[0009] Moreover, a previous record medium becomes by the magnetic tape, and a previous storage means is held possible [exchange], and previous image pck-up equipment carries out the data compression of the image pck-up result, and it is made to record on a previous storage means with an audio signal at this time.

[0010] Furthermore it replaces with this, and image pck-up equipment records a recognition signal on a previous storage means and a previous record medium with a previous image pck-up result, and enables it to reproduce the image pck-up result which corresponds on the basis of this recognition signal from a storage means and a record medium.

[0011] If an image pck-up result is cyclically recorded on a regular storage means one by one, this standby state is canceled in a standby state by these means and record of the image pck-up result to a previous storage means will be ended while starting record of an image pck-up result to a previous record medium, the image pck-up result of a convention period just before starting record of an image pck-up result to a record medium can be held to this storage means.

[0012] Moreover, if a previous record medium becomes by the magnetic tape, a previous storage means is held possible [exchange], previous image pck-up equipment carries out the data compression of the image pck-up result and it memorizes for a previous storage means with an audio signal, it is applicable to a camera one apparatus video tape recorder.

[0013] Furthermore, a recognition signal is recorded on a previous storage means and a previous record medium with a previous image pck-up result, and if it enables it to reproduce the image pck-up result which corresponds on the basis of this recognition signal from a storage means and a record medium, in an editing task etc., a corresponding image pck-up result is simply reproducible.

[0014]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained in full detail, referring to a drawing suitably.

[0015] Drawing 1 is the block diagram showing the recording system of the camera one apparatus video tape recorder concerning the gestalt of operation of the 1st of this invention, and records video signal similar virus which pictures a desired photographic subject and is obtained on a magnetic tape 2 in this camera one apparatus video tape recorder 1.

[0016] That is, in this camera one apparatus video tape recorder 1, the camera digital disposal circuit 3 carries out signal processing of the output signal of the CCD solid state image pickup device which is not illustrated, and outputs video signal DV which comes to be as a result of an image pck-up in the form of a digital signal. The data compression of this video signal DV is carried out by the regular data compression technique, and the continuing video-signal compression circuit 4 outputs it here — this data compression technique — MPEG (Moving Picture Experts Group) — the analog data compression technique — it is — the same hierarchy composition as MPEG — and the amount of data is reduced by the technique of a motion compensation, quantization, and variable length coding.

[0017] As this shows drawing 2, the video-signal compression circuit 4 changes into 4 [bit] and digital video signal DV1 of 6.75 [MHz] 10 [bit] and video signal DV of 27 [MHz] which are obtained from the camera digital disposal circuit 3, and reduces and outputs the amount of data to abbreviation 1/10. In addition, the video-signal compression circuit 4 makes a unit GOP (Group Of Picture) which becomes by one of the hierarchy composition of this kind of the data compression technique, carries out a data compression, and thereby, by the camera one apparatus video tape recorder 1, even if it reproduces digital video signal DV1 at random, it is made as [reproduce / the original digital video signal DV].

[0018] The error correcting code addition circuit 5 is outputted in order of a convention, after adding an error correcting code to this digital video signal DV1 per regular block. A modulation circuit 6 carries out coding processing of the output data of this error correcting code addition circuit 5 with the coding method suitable for record of a magnetic tape 2, and outputs them in the form of serial data. The rotary transformer 7 transmits the output data of this modulation circuit 6 to the record amplifying circuit 8 recorded by the rotating drum, this record amplifying circuit 8 drives the magnetic head which is not illustrated following the output data of this rotary transformer 7, and forms a recording track in a magnetic tape 2 aslant one by one by this, and records digital video signal DV.

[0019] At this time, between the regular periods during the period which scans a magnetic tape aslant, this video signal DV is recorded, and the corresponding magnetic head divides the field where a recording track remains, and records audio signal SA and index signal ID at the camera one apparatus video tape recorder 1, respectively.

[0020] That is, in the camera one apparatus video tape recorder 1, the analog-to-digital-conversion circuit (A/D) 9 carries out analog-to-digital-conversion processing of the audio signal inputted through a microphone etc., and generates digital audio signal DA. The error correcting code addition circuit 5 is outputted in order of a convention, after adding an error correcting code to this digital audio signal DA per regular block in addition to digital video signal DV1. In addition to digital video signal DV1, a modulation circuit 6 carries out coding processing, and outputs this digital audio signal DA in the form of serial data.

[0021] At this time, a modulation circuit 6 outputs this serial data to regular timing on the basis of the timing of a scan

of the magnetic head, thereby, by the camera one apparatus video tape recorder 1, divides a recording track and records audio signal SA and video signal simian virus.

[0022] Furthermore, in this camera one apparatus video tape recorder 1, through the modulation circuit which is not illustrated, the rotary transformer 7 receives to the timing of a conversion of index signal ID outputted from the system control circuit 13, is replaced with audio signal SA and video signal simian virus to regular timing, and carries out slanting record of this index signal ID at a magnetic tape 2.

[0023] On the other hand, by driving the regular fixed head according to index signal ID, the record amplifying circuit 14 forms the recording track extended to the longitudinal direction of a magnetic tape 2, and records index signal ID on this recording track.

[0024] In this camera one apparatus video tape recorder 1, this index signal ID is outputted following press operation of ***** 15, and whenever photography of one scene is completed, it is generated by the system control circuit 13 here so that an increment may be carried out. That is, in this kind of camera one apparatus video tape recorder 1, press operation of ***** 15 is repeated, it is used so that the material of number 100 cut may be recorded on one magnetic tape from a number cut, and it is made as [perform / an editing task] by rerecording each material alternatively if needed. Thereby, it is formed so that processing of search of each material etc. can be performed on the basis of this index signal ID in the camera one apparatus video tape recorder 1 at the time of edit, and it is made as [improve / the efficiency of an editing task / by this].

[0025] In addition to the recording system of video signal DV to such a magnetic tape 2, and audio signal SA, the camera one apparatus video tape recorder 1 holds video signal DV and audio signal SA just before starting record to a magnetic tape 2 in memory 16.

[0026] That is, in the camera one apparatus video tape recorder 1, the rate conversion circuit 17 is received in 4 [bit] and digital video signal DV1 of 6.75 [MHz] which are outputted from the video-signal compression circuit 4, and is changed and outputted to 16 [bit] and the digital video signal of 1.6875 [MHz] (drawing 2). Moreover, the rate conversion circuit 17 receives digital audio signal DA outputted from the analog-to-digital-conversion circuit 9, and changes and outputs it to the data of 16 bit parallel similarly. Thereby by the camera one apparatus video tape recorder 1, it is made as [record / digital video signal DV1 and digital audio signal DA / efficiently].

[0027] It is formed in this camera one apparatus video tape recorder 1 by the memory card held free [attachment and detachment], address control is carried out by the memory control circuit 18, and memory 16 records digital video signal DV1, digital audio signal DA, and index signal ID. That is, as shown in drawing 3, this memory 16 divides room into SA and a data area.

[0028] Memory 16 divides this data area into two or more record sections AR0, AR1, and AR2 and further, and holds digital video signal DV1 and digital audio signal DA just before starting record of each material to each fields AR0, AR1, and AR2 and .. corresponding to each material recorded on the magnetic tape 2. In the mode of operation of standby, operation of this record will be stopped and record of this digital video signal DV1 and digital audio signal DA will be performed here; if digital video signal DV1 and digital audio signal DA are recorded to one cyclically [these record sections AR0, AR1, and AR2 and] one by one and ***** 15 is pressed according to the address data published by the memory control circuit 18, as Arrow a shows.

[0029] As this shows drawing 4, in the camera one apparatus video tape recorder 1 About digital video signal DV1 (drawing 4(A)) outputted one by one per [circuit / video-signal compression / 4] GOP this digital video signal DV1 — memory 16 — one by one — cyclic — recording (drawing 4 (B)) — Time t — if press operation of ***** 15 is carried out by 1, record in memory 16 will be stopped and GOP to continuing digital video signal DV1 will be recorded on a magnetic tape 2 (drawing 4 (C)) In practice, in the gestalt of this operation, room is secured and these record sections AR0, AR1, and AR2 and are formed so that digital video signal DV1 and digital audio signal DA for several seconds to number 10 seconds can be recorded, and thereby, they are made by the camera one apparatus video tape recorder 1 as [record / digital video signal DV1 and digital audio signal DA for several seconds to number 10 seconds just before pressing ***** 15 and starting videotape recording].

[0030] On the other hand, memory 16 records administrative data on SA, and records a correspondence relation with a magnetic tape 2 etc. with this administrative data. Furthermore, memory 16 divides the record sections AR0, AR1, and AR2 of a data area, and the SA which continues corresponding to The record sections AR0, AR1, and AR2 corresponding to the divided each field, the address data which specify (AR0, AR1, AR2, ...). Corresponding index signals ID0, ID1, and ID2, corresponding Each record sections AR0, AR1, and AR2, address data ADm+1 of which specify the head record position of digital video signal DV1 and digital audio signal DA, ADn+1, ADn+1, and .. are recorded.

[0031] it writes — in carrying out, the memory control circuit 18 is controlled by the system control circuit 13, it switches operation, publishes address data etc. in memory 16, and controls operation of memory 16 The system control circuit 13 is formed with the microcomputer which controls operation of this camera one apparatus video tape recorder 1 whole.

[0032] That is, if this camera one apparatus video tape recorder 1 is loaded with a magnetic tape 2 and memory 16 and this camera one apparatus video tape recorder 1 is set as a standby mode, the system control circuit 13 will control the memory control circuit 18, will rewrite the administrative data of memory 16 by the volume data of a magnetic tape 2, and, thereby, will record a correspondence relation with a magnetic tape 2 on memory 16.

[0033] Furthermore, the system control circuit 13 sets the memory control circuit 18 to a standby mode in this state, and records cyclically digital video signal DV1 and digital audio signal DA on the 1st record section AR0 one by one. If a cameraman does press operation of ***** 15 in this state, the system control circuit 13 switches the mode of operation of this camera one apparatus video tape recorder 1 whole to a recording mode, and while recording digital video signal DV1 and digital audio signal DA which are inputted one by one on a magnetic tape 2, record of digital video signal DV1 to memory 16 and digital audio signal DA will be stopped.

[0034] As proposed to the address data ADm (drawing 3) with which the memory control circuit 18 stopped record of digital video signal DV1 and digital audio signal DA corresponding to this Only a value 1 adds an address value and it is address data ADm+1 (namely, it becomes by the address data of the memory 16 which suited just before starting the continuing record). the address data by which oldest video signal DV1 and audio signal DA were recorded in this record section AR0 — becoming — it generates and this address data ADm+1 is recorded on corresponding SA Moreover, index signal ID0 simultaneously outputted from the system control circuit 13 is recorded on this corresponding SA, and the continuing standby state is awaited.

[0035] If the system control circuit 13 starts record to a magnetic tape 2 corresponding to this Output this index signal ID to memory 16, and output this index signal ID to the record amplifying circuit 14 and the rotary transformer 7, and this uses an index signal effectively. The correspondence relation between digital video signal DV1 and digital audio signal DA which were recorded in memory 16, and digital video signal DV1 and digital audio signal DA which are continuously recorded on a magnetic tape 2 is recorded on a magnetic tape 2 and memory 16.

[0036] Furthermore, the system control circuit 13 starts record of digital video signal DV1 and digital audio signal DA to the record section AR1 when memory 16 continues while stopping record to a magnetic tape 2, if a cameraman presses ***** 15 again in this state and the mode of operation of the camera on apparatus video tape recorder 1 is set to a standby mode. It can record without only regular time's just before starting record to a magnetic tape 2 being able to hold an image pick-up result in memory 16, avoiding degradation of mobility effectively, and missing the opportunity of precious photography in the camera one apparatus video tape recorder 1, by this. by furthermore having clarified correspondence relation between a magnetic tape 2 and memory 16 on the basis of index signal ID at this time, it is reproducing continuously digital video signal DV1 and digital audio signal DA which correspond on the basis of this index signal ID in the work of edit etc. — it can do — the part — processing of an editing task etc. can be performed efficiently

[0037] That is, drawing 5 is the block diagram showing the video tape recorder of an edit system which edits the magnetic tape 2 recorded by this camera one apparatus video tape recorder 1. This edit system is reproduced by the video tape recorder 20, rerecords digital video signal DV1 and digital audio signal DA which were recorded on a magnetic tape 2 and the memory 16 corresponding to this magnetic tape 2 on other video tape recorders, and edits digital video signal DV1 and digital audio signal DA by other video tape recorders.

[0038] That is, in this video tape recorder 20, the reproduction amplifying circuit 21 is recorded by the rotating drum, amplifies the regenerative signal obtained from the magnetic head, and outputs it to the rotary transformer 22, and the rotary transformer 22 outputs this regenerative signal to a demodulator circuit 24.

[0039] A demodulator circuit 24 incorporates and makes this regenerative signal binary to regular timing, and decodes and outputs the serial data obtained as a result. The continuing error correction circuit 28 carries out error correction processing of the output data of this demodulator circuit 24, and, thereby, reproduces and outputs digital audio signal DA and digital video signal DV1. The digital-to-analog-conversion circuit (D/A) 27 carries out digital-to-analog-conversion processing of the digital audio signal DA inputted one by one, and, thereby, reproduces and outputs the original audio signal SA.

[0040] On the other hand, the video-signal extension circuit 29 carries out data extension of digital video signal DV1 inputted one by one, and, thereby, reproduces and outputs digital video signal DV.

[0041] The reproduction amplifying circuit 30 amplifies and outputs the regenerative signal of the magnetic tape 2 obtained from the fixed head. A demodulator circuit 31 incorporates and makes binary the regenerative signal outputted from this reproduction amplifying circuit 30, and, thereby, reproduces and outputs index signal ID. Moreover, the reproduction amplifying circuit 30 incorporates and makes binary the regenerative signal outputted from the rotary transformer 22 to regular timing, and, thereby, reproduces and outputs index signal ID which carried out slanting record to a magnetic tape 2.

[0042] Thereby, by the video tape recorder 20, when carrying out edit processing per search and recording track quickly by index signal ID recorded on the longitudinal direction of a magnetic tape 2 when the head of a magnetic tape 2 was pulled out by a rapid traverse, rewinding, etc., it is made as [process / certainly / to a magnetic tape 2 / by index signal ID which carried out slanting record / it].

[0043] In addition to the reversion system to this magnetic tape 2, in a video tape recorder 20, the rate conversion circuit 32 changes and outputs the digital video signal and digital audio signal of 16 bit parallel which are outputted from memory 16 to the data of the original bit parallel at the time of reproduction. The memory control circuit 33 outputs address data etc. to memory 16, and controls operation of memory 16.

[0044] Index signal ID which the system control circuit 34 was formed with the microcomputer which controls operation of this video tape recorder 20 whole, and was read from memory 16. It is based on index signal ID reproduced from the magnetic tape 2. By outputting digital video signal DV1 and digital audio signal DA to the video-signal extension circuit 29 and the digital-to-analog-conversion circuit 27 one by one from memory 16 and a magnetic tape 2. A correspondence relation is specified by index signal ID, and digital video signal DV1 and digital audio signal DA which were divided and recorded on memory 16 and the magnetic tape 2 are reproduced continuously.

[0045] That is, first, the head record position of the 1st record section AR0 address-data-AD(s) the system control circuit 34 from the SA of memory 16, and it reads corresponding index signal ID. Then, after the system control circuit 34 pulls out the head of a magnetic tape 2 to the record starting position corresponding to a rapid traverse, rewinding, and the 1st record section AR0 for a magnetic tape 2, carrying out the monitor of index signal ID obtained from the reproduction amplifying circuit 30, it suspends a run of a magnetic tape 2 and holds it in the reproduction standby state.

[0046] Then, the system control circuit 34 outputs this address data AD to the memory control circuit 33 with the command of read-out. Following this, from the record starting position specified by this address data AD, the memory control circuit 33 publishes address data one by one, reads digital video signal DV1 and digital audio signal DA, and outputs these read signals DV1 and DA to the video-signal extension circuit 29 and the digital-to-analog-conversion circuit 27 from memory 16. This outputs digital video signal DV1 and digital audio signal DA which were recorded on memory 16 to the video tape recorder for dubbing in a video tape recorder 20.

[0047] The system control circuit 34 will control the whole operation by this state to cancel the standby state of a magnetic tape 2 and to start reproduction of a magnetic tape 2, if the monitor of the operation of the memory control circuit 33 is carried out and the memory control circuit 33 starts read-out operation in the address in front of the address data AD. This outputs continuing digital video signal DV1 and digital audio signal DA to the video tape recorder for dubbing in a video tape recorder 20 following digital video signal DV1 and digital audio signal DA which were recorded just before pressing ***** 15.

[0048] The system control circuit 34 loads index signal ID of the record section AR1 which continues from the SA of memory 16, and the record starting address data AD in this state, if it becomes the record starting position of the material which continues in a magnetic tape 2, a magnetic tape 2 will be switched to a reproducing standby state, and digital video signal DV1 and digital audio signal DA which continue from memory 16 on the basis of this record starting address data AD will be read. Thereby, by the video tape recorder 20, this the processing of a series of is repeated,

and after rerecording separately digital video signal DV1 and digital audio signal DA which were recorded on a magnetic tape 2 and memory 16 on a magnetic tape, it is made as [perform / an editing task / by the same procedure as usual].

[0049] digital video signal DV which will picture a photographic subject and will be obtained in the camera on apparatus video tape recorder 1 (drawing 1) in the above composition if a cameraman sets to a standby state — the video-signal compression circuit 4 — setting — about — after being compressed into 1/10 of the amounts of data, it is inputted into the rate conversion circuit 17 with digital audio signal DA, and is changed into the data of 16 bit parallel. The data of these 16 bit parallel are cyclically recorded on the record section of the convention formed in the data area of memory 16 one by one, and, thereby, newest digital video signal DV1 and newest digital audio signal DA are held in this record section at a part for the room of this record section, and a usual state.

[0050] If a cameraman does press operation of ***** 15 in this state, halt control of the writing of digital video signal DV1 to memory 16 and digital audio signal DA will be carried out, and digital video signal DV1 and digital audio signal DA just before this presses ***** 15 will be held at memory 16. Record by the magnetic tape 2 is started simultaneously, and slanting record of digital video signal DV1 and the digital audio signal DA is carried out at a magnetic tape 2 through the error correcting code addition circuit 5, a modulation circuit 6, the rotary transformer 7, and the record amplifying circuit 8.

[0051] It can record without being able to picture a series of photographic subjects and missing a precious motion picture camera meeting from a convention period just before digital video signal DV1 and digital audio signal DA after this presses ***** 15 are recorded on a magnetic tape 2 and press ***** 15 by memory 16 and the magnetic tape 2.

[0052] At this time, index signal ID is outputted by the system control circuit 13, and the address data AD of a record end position to the head record position of memory 16 are generated in the system control circuit 13. The address data AD and index signal ID of this head record position are recorded on the SA of memory 16, and this index signal ID is recorded on the recording track and slanting recording track which the recording start position of a magnetic tape 2 and a longitudinal direction extend. The relation of a magnetic tape 2 and the content of record of memory 16 is recorded on memory 16 and a magnetic tape 2 by this, and the reproduction starting position of memory 16 is recorded on the SA of memory 16.

[0053] After this reproduces digital video signal DV1 and digital audio signal DA from the head record position recorded on memory 16 at the time of reproduction, digital video signal DV1 and digital audio signal DA which correspond on the basis of index signal ID continuously can be reproduced from a magnetic tape 2, and a series of contents divided and recorded on a magnetic tape 2 and memory 16 can be reproduced in order of record.

[0054] If according to the above composition digital video signal DV1 and digital audio signal DA are cyclically recorded on memory 16 one by one and ***** 15 is pressed in a standby state, while stopping record of memory 16, it can leave record also about digital video signal DV1 and digital audio signal DA just before pressing ***** 15 by recording digital video signal DV1 and digital audio signal DA on a magnetic tape 2. Only by this recording memory card, a photographic subject can be picture without missing the opportunity of precious photography, and degradation of the mobility of the part camera one apparatus video tape recorder can be avoided effectively.

[0055] Even when press operation of ***** 15 is repeated and many materials are recorded on a magnetic tape 2 by having recorded the index signal at this time, and having associated and recorded the content of memory 16 and a magnetic tape 2, digital video signal DV1 and digital audio signal DA which correspond from memory 16 can be certainly reproduced to the material recorded on this magnetic tape 2.

[0056] In addition, although the case where rerecorded digital video signal DV1 and digital audio signal DA by other video tape recorders, and they were edited was described, you may make it rerecord this invention not only on this but on a hard disk drive unit, an optical disk unit, etc. in an edit system in the gestalt of above-mentioned operation. Moreover, you may carry out direct edit processing on the basis of the index signal recorded on the content of SA, and the magnetic tape in these cases.

[0057] Moreover, in the gestalt of above-mentioned operation, although the case where the same index signal was recorded by the magnetic tape 2 and memory 16 was described, this invention may record not only this but an index signal which can apply various recognition signals if a correspondence relation can be grasped about a magnetic tape 2 and the content of record of memory 16 in short, for example, is different by the magnetic tape 2 and memory 16. Moreover, it replaces with an index signal, the content of the SA corresponding to a magnetic tape side is recorded, and it is good also as a recognition signal.

[0058] Furthermore, although the case where an image pick-up result was recorded on a magnetic tape and memory card in the gestalt of above-mentioned operation was described, this invention can also record an image pick-up result on a magnetic tape 2 collectively by summarizing the content of memory 16 to the convention field of a magnetic tape 2, and rerecording it in advance of the unloading of not only this but a magnetic tape.

[0059] Moreover, in the gestalt of above-mentioned operation, although the case where a magnetic tape was used as a record medium was described, this invention can be widely applied, when using a magnetic disk as a record medium, using an optical disk further and recording a video signal using various record media not only this but. In addition, when using record media, such as these magnetic disks, it may replace with memory 16 and the convention field of these record media may be used.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the camera one apparatus video tape recorder concerning the gestalt of operation of this invention.

[Drawing 2] It is the block diagram with which explanation of processing of the digital video signal in the camera one apparatus video tape recorder of drawing 1 is presented.

[Drawing 3] It is the abbreviation diagram showing the composition of the memory in the camera one apparatus video tape recorder of drawing 1.

[Drawing 4] It is the abbreviation diagram with which explanation of operation of the camera one apparatus video tape recorder of drawing 1 is presented.

[Drawing 5] It is the block diagram showing the video tape recorder which edits the content recorded by the camera one apparatus video tape recorder of drawing 1.

[Description of Notations]

- 1 Camera One Apparatus Video Tape Recorder
- 2 Magnetic Tape
- 4 Video-Signal Compression Circuit
- 16 Memory
- 17 32 Rate conversion circuit
- 18 33 Memory control circuit
- 13 34 System control circuit
- 29 Video-Signal Extension Circuit

[Translation done.]

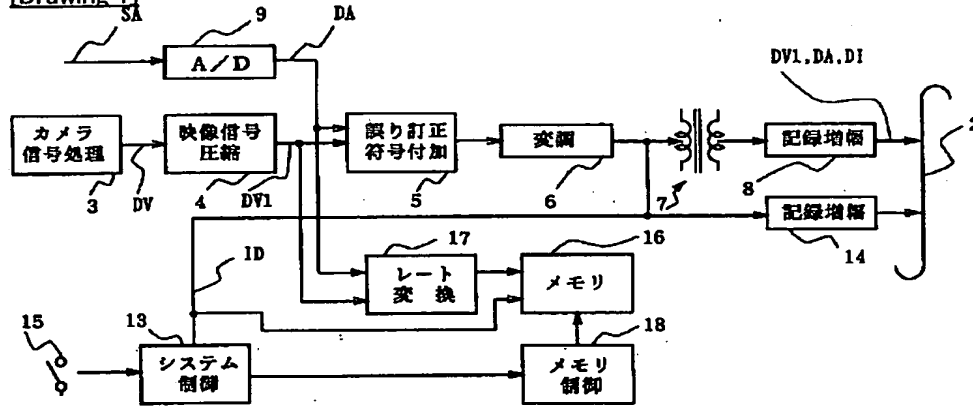
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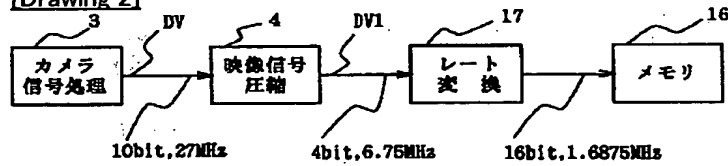
DRAWINGS

[Drawing 1]

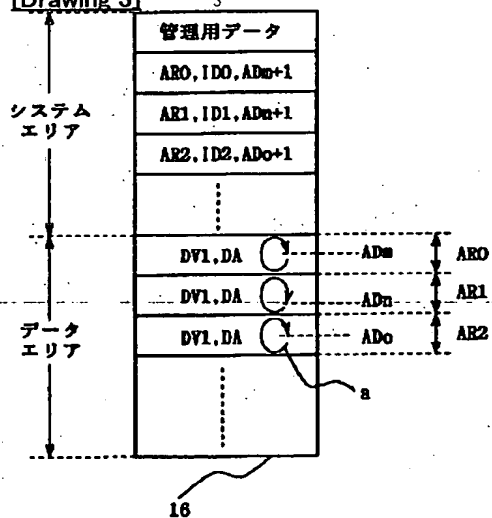


1:カメラ型ビデオテープレコーダ

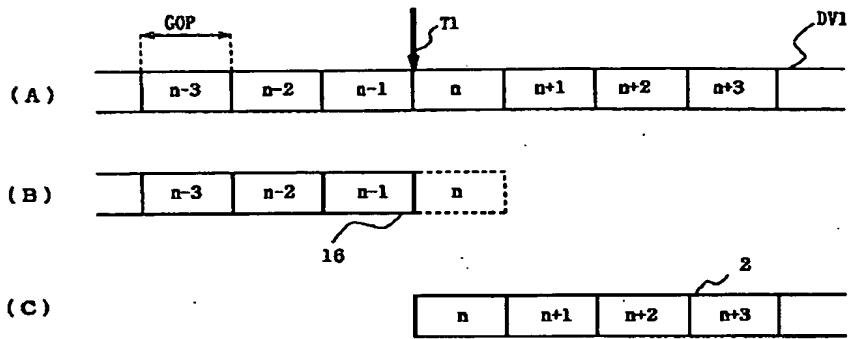
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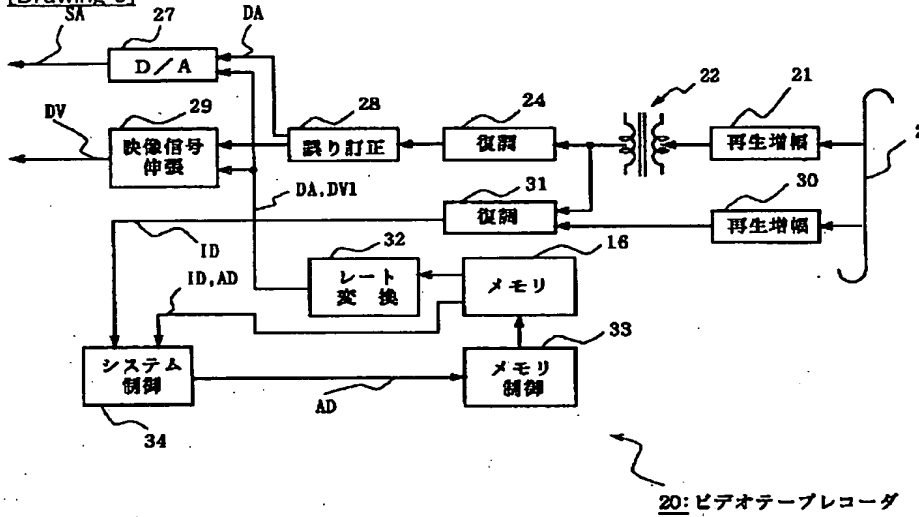
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開平9-83952

(43)公開日 平成9年(1997)3月28日

(51)Int.Cl. ^o	識別記号	庁内整理番号	F I	技術表示箇所
H 0 4 N	5/92		H 0 4 N	H
	5/232		5/232	Z
	5/765		5/91	L
	5/937		5/93	C

審査請求 未請求 請求項の数3 FD (全 8 頁)

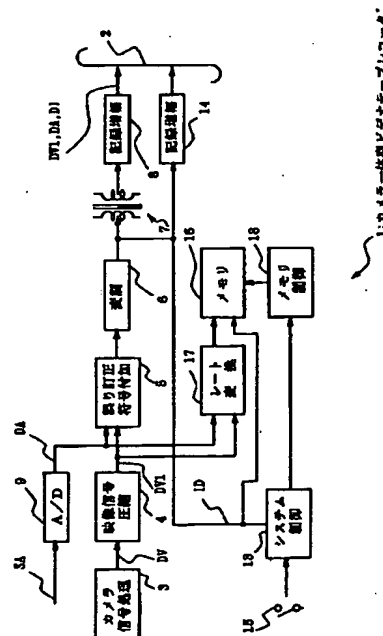
(21)出願番号	特願平7-259541	(71)出願人	000002185 ソニー株式会社 東京都品川区北品川6丁目7番35号
(22)出願日	平成7年(1995)9月13日	(72)発明者	佐渡 敏幸 東京都品川区西五反田3丁目9番17号 ソ ニーエンジニアリング株式会社内
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(54) 【発明の名称】 撮像装置

(57) 【要約】

【課題】撮像装置に関し、例えばカメラ一体型ビデオテープレコーダにおいて、機動性の劣化を有効に回避して、貴重な撮影の機会を逃すことなく記録できるようにする。

【解決手段】規定の記憶手段16に順次循環的に撮像結果DV1を記録し、記録媒体2に撮像結果DV1の記録を開始する直前の規定時間の撮像結果DV1を、この記憶手段16に保持する。



【特許請求の範囲】

【請求項1】 撮像結果を規定の記録媒体に記録する撮像装置において、待機状態において、規定の記憶手段に順次循環的に前記撮像結果を記録し、

前記待機状態が解除されると、前記記録媒体に前記撮像結果の記録を開始すると共に、前記記憶手段への前記撮像結果の記録を終了することを特徴とする撮像装置。

【請求項2】 前記記録媒体は、磁気テープであり、前記記憶手段は、交換可能に保持され、前記撮像装置は、前記撮像結果をデータ圧縮して、オーディオ信号と共に前記記憶手段に記録することを特徴とする請求項1に記載の撮像装置。

【請求項3】 前記撮像装置は、前記記憶手段及び前記記録媒体に、前記撮像結果と共に、識別信号を記録し、前記識別信号を基準にして対応する撮像結果を前記記憶手段及び前記記録媒体から再生できるようにしたことを特徴とする請求項1に記載の撮像装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、撮像装置に関し、例えばカメラ一体型ビデオテープレコーダにおいて、規定の記憶手段に順次循環的に撮像結果を記録し、記録媒体に撮像結果の記録を開始する直前の規定時間の撮像結果を、この記憶手段に保持することにより、機動性の劣化を有効に回避して、貴重な撮影の機会を逃すことなく記録できるようにする。

【0002】

【従来の技術】従来、この種の撮像装置でなるカメラ一体型ビデオテープレコーダにおいては、いわゆるワンマンオペレーションが可能なことにより、取材現場に携帯して種々の映像を記録し、記録した映像をニュース番組等に使用できるようになされている。

【0003】

【発明が解決しようとする課題】ところでこのような取材現場において、カメラマンは、カメラ一体型ビデオテープレコーダの動作モードを待機状態に保持して待機し、取材の機会が訪れると、録画釦を押圧することによりカメラ一体型ビデオテープレコーダの動作モードを録画モードに切り換え、これにより種々の映像を記録する。

【0004】従ってカメラマンの予測し得ないような事態の急変等が発生した場合、従来のカメラ一体型ビデオテープレコーダでは、即座に録画釦を押圧しても、決定的な映像録画の機会を失う場合があった。

【0005】このような事態の急変が事前に予測される場合、カメラ一体型ビデオテープレコーダを常時録画状態に保持する方法も考えられるが、これでは磁気テープ、バッテリーの消費量が膨大になり、カメラ一体型ビデオ

テープレコーダの機動性が損なわれる問題がある。また別途ビデオテープレコーダを接続して映像信号を常時記録する方法も考えられるが、この場合もカメラ一体型ビデオテープレコーダの機動性が損なわれる問題がある。

【0006】これに対してこのような場合に、別途外部メモリを介して撮像結果を遅延させて磁気テープに記録する方法も考えられるが、この場合も外部メモリを接続した分、カメラ一体型ビデオテープレコーダの機動性が損なわれる問題がある。

【0007】本発明は以上の点を考慮してなされたもので、カメラ一体型ビデオテープレコーダの機動性の劣化を有効に回避して、貴重な撮影機会を逃すことなく記録することができる撮像装置を提案しようとするものである。

【0008】

【課題を解決するための手段】かかる課題を解決するため本発明においては、撮像結果を規定の記録媒体に記録する撮像装置に適用する。ここで待機状態において、規定の記憶手段に順次循環的に先の撮像結果を記録し、この待機状態が解除されると、記録媒体に撮像結果の記録を開始すると共に、先の記憶手段への撮像結果の記録を終了する。

【0009】またこのとき、先の記録媒体が、磁気テープであり、先の記憶手段が、交換可能に保持され、先の撮像装置が、撮像結果をデータ圧縮して、オーディオ信号と共に先の記憶手段に記録するようにする。

【0010】さらにこれに代えて、撮像装置が、先の記憶手段及び記録媒体に、先の撮像結果と共に、識別信号を記録し、この識別信号を基準にして対応する撮像結果を記憶手段及び記録媒体から再生できるようにする。

【0011】これらの手段により、待機状態において、規定の記憶手段に順次循環的に撮像結果を記録し、この待機状態が解除されると、先の記録媒体に撮像結果の記録を開始すると共に、先の記憶手段への撮像結果の記録を終了すれば、記録媒体に撮像結果の記録を開始する直前の、規定期間の撮像結果を、この記憶手段に保持することができる。

【0012】また先の記録媒体が、磁気テープであり、先の記憶手段が、交換可能に保持され、先の撮像装置が、撮像結果をデータ圧縮して、オーディオ信号と共に先の記憶手段に記憶すれば、カメラ一体型ビデオテープレコーダに適用することができる。

【0013】さらに先の記憶手段及び記録媒体に、先の撮像結果と共に、識別信号を記録し、この識別信号を基準にして対応する撮像結果を記憶手段及び記録媒体から再生できるようにすれば、編集作業等において、対応する撮像結果を簡易に再生することができる。

【0014】

【発明の実施の形態】以下、適宜図面を参照しながら本

発明の実施の形態を詳述する。

【0015】図1は、本発明の第1の実施の形態に係るカメラ一体型ビデオテープレコーダの記録系を示すブロック図であり、このカメラ一体型ビデオテープレコーダ1においては、所望の被写体を撮像して得られるビデオ信号SVを磁気テープ2に記録する。

【0016】すなわちこのカメラ一体型ビデオテープレコーダ1において、カメラ信号処理回路3は、図示しないCCD固体撮像素子の出力信号を信号処理し、撮像結果でなるビデオ信号DVをデジタル信号の形式で出力する。続く映像信号圧縮回路4は、このビデオ信号DVを規定のデータ圧縮手法によりデータ圧縮して出力する。ここでこのデータ圧縮手法は、MPEG (Moving Picture Experts Group) に類似のデータ圧縮手法であり、MPEGと同様の階層構成でかつ動き補償、量子化、可変長符号化の手法によりデータ量を低減する。

【0017】これにより図2に示すように、映像信号圧縮回路4は、カメラ信号処理回路3より得られる10 [bit]、27 [MHz] のビデオ信号DVを4 [bit]、6.75 [MHz] のデジタルビデオ信号DV1に変換し、データ量を約1/10に低減して出力する。なお映像信号圧縮回路4は、この種のデータ圧縮手法の階層構成の1つでなるGOP (Group Of Picture) を単位としてデータ圧縮し、これによりカメラ一体型ビデオテープレコーダ1では、デジタルビデオ信号DV1をランダムに再生しても、元のデジタルビデオ信号DVを再生できるようになされている。

【0018】誤り訂正符号付加回路5は、規定のブロック単位でこのデジタルビデオ信号DV1に誤り訂正符号を付加した後、規定の順序で出力する。変調回路6は、磁気テープ2の記録に適した符号化方式によりこの誤り訂正符号付加回路5の出力データを符号化処理し、シリアルデータの形式で出力する。ロータリートランス7は、この変調回路6の出力データを回転ドラムに搭載された記録増幅回路8に伝送し、この記録増幅回路8は、このロータリートランス7の出力データに応動して図示しない磁気ヘッドを駆動し、これにより磁気テープ2に順次斜めに記録トラックを形成してデジタルビデオ信号DVを記録する。

【0019】このときカメラ一体型ビデオテープレコーダ1では、対応する磁気ヘッドが磁気テープを斜めに走査する期間の間の、規定の期間の間の、このビデオ信号DVを記録し、記録トラックの残る領域を分割してそれぞれオーディオ信号SA及びインデックス信号IDを記録する。

【0020】すなわちカメラ一体型ビデオテープレコーダ1において、アナログデジタル変換回路(A/D)9は、マイクロフォン等を介して入力されるオーディオ信号をアナログデジタル変換処理し、デジタルオーディオ信号DAを生成する。誤り訂正符号付加回路5

は、デジタルビデオ信号DV1に加えて、規定のブロック単位でこのデジタルオーディオ信号DAに誤り訂正符号を付加した後、規定の順序で出力する。変調回路6は、デジタルビデオ信号DV1に加えて、このデジタルオーディオ信号DAを符号化処理し、シリアルデータの形式で出力する。

【0021】このとき変調回路6は、磁気ヘッドの走査のタイミングを基準にして、規定のタイミングでこのシリアルデータを出力し、これによりカメラ一体型ビデオテープレコーダ1では、記録トラックを分割してオーディオ信号SA及びビデオ信号SVを記録する。

【0022】さらにこのカメラ一体型ビデオテープレコーダ1において、ロータリートランス7は、図示しない変調回路を介して、システム制御回路13より出力されるインデックス信号IDを規定のタイミングで受け、規定のタイミングでオーディオ信号SA、ビデオ信号SVに代えてこのインデックス信号IDを磁気テープ2に斜め記録する。

【0023】これに対して記録増幅回路14は、インデックス信号IDに応じて規定の固定ヘッドを駆動することにより、磁気テープ2の長手方向に延長する記録トラックを形成し、この記録トラックにインデックス信号IDを記録する。

【0024】ここでこのインデックス信号IDは、このカメラ一体型ビデオテープレコーダ1において、録画釦15の押圧操作に応動して出力され、1シーンの撮影が完了する毎にインクリメントされるようにシステム制御回路13により生成される。すなわちこの種のカメラ一体型ビデオテープレコーダ1においては、録画釦15の押圧操作を繰り返して、1本の磁気テープに数カットから数百カットの素材を記録するように使用され、必要に応じて各素材を選択的に記録し直すことにより、編集作業を実行するようになされている。これによりカメラ一体型ビデオテープレコーダ1においては、このインデックス信号IDを基準にして編集時、各素材の頭出し等の処理を実行できるように形成され、これにより編集作業の効率を向上できるようになされている。

【0025】このような磁気テープ2に対するビデオ信号DV及びオーディオ信号SAの記録系に加えて、カメラ一体型ビデオテープレコーダ1は、磁気テープ2に記録を開始する直前のビデオ信号DV及びオーディオ信号SAをメモリ16に保持する。

【0026】すなわちカメラ一体型ビデオテープレコーダ1において、レート変換回路17は、映像信号圧縮回路4より出力される4 [bit]、6.75 [MHz] のデジタルビデオ信号DV1を受け、16 [bit]、1.6875 [MHz] のデジタルビデオ信号に変換して出力する(図2)。またレート変換回路17は、アナログデジタル変換回路9より出力されるデジタルオーディオ信号DAを受け、同様に16ビットバ

ラレルのデータに変換して出力する。これによりカメラ一体型ビデオテープレコーダ1では、効率良くデジタルビデオ信号DV1及びデジタルオーディオ信号DAを記録できるようになされている。

【0027】メモリ16は、このカメラ一体型ビデオテープレコーダ1に着脱自在に保持されたメモリカードで形成され、メモリ制御回路18によりアドレス制御されて、デジタルビデオ信号DV1、デジタルオーディオ信号DA及びインデックス信号IDを記録する。すなわち図3に示すように、このメモリ16は、メモリ空間をシステムエリアとデータエリアに分割する。

【0028】メモリ16は、さらにこのデータエリアを複数の記録領域AR0、AR1、AR2、……に分割し、磁気テープ2に記録した各素材に対応して、各素材の記録を開始する直前のデジタルビデオ信号DV1及びデジタルオーディオ信号DAを各領域AR0、AR1、AR2、……に保持する。ここでこのデジタルビデオ信号DV1及びデジタルオーディオ信号DAの記録は、待機の動作モードにおいて、矢印aで示すように、メモリ制御回路18により発行されるアドレスデータに従って、この記録領域AR0、AR1、AR2、……の1つに順次循環的にデジタルビデオ信号DV1及びデジタルオーディオ信号DAを記録し、録画釦15が押圧されると、この記録の動作を停止して実行される。

【0029】これにより図4に示すようにカメラ一体型ビデオテープレコーダ1では、映像信号圧縮回路4よりGOP単位で順次出力されるデジタルビデオ信号DV1(図4(A))について、このデジタルビデオ信号DV1をメモリ16に順次循環的に記録し(図4(B))、時点t1で録画釦15が押圧操作されると、メモリ16への記録を中止し、続くGOPからデジタルビデオ信号DV1を磁気テープ2に記録する(図4(C))。實際上、この実施の形態において、これら記録領域AR0、AR1、AR2、……は、数秒から数十秒のデジタルビデオ信号DV1及びデジタルオーディオ信号DAを記録できるようにメモリ空間を確保して形成され、これによりカメラ一体型ビデオテープレコーダ1では、録画釦15を押圧して録画を開始する直前の数秒から数十秒のデジタルビデオ信号DV1及びデジタルオーディオ信号DAを記録できるようになされている。

【0030】これに対してメモリ16は、システムエリアに管理用データを記録し、この管理用データにより磁気テープ2との対応関係等を記録する。さらにメモリ16は、データエリアの記録領域AR0、AR1、AR2、……に対応して続くシステムエリアを分割し、各分割した領域に、対応する記録領域AR0、AR1、AR2、……を指定するアドレスデータ(AR0、AR1、AR2、……)、対応するインデックス信号ID0、I

D1、ID2、……、各記録領域AR0、AR1、AR2、……のデジタルビデオ信号DV1及びデジタルオーディオ信号DAの先頭記録位置を指定するアドレスデータADm+1、ADn+1、ADo+1、……を記録する。

【0031】かくするにつきメモリ制御回路18は、システム制御回路13により制御されて動作を切り換え、メモリ16にアドレスデータ等を発行してメモリ16の動作を制御する。システム制御回路13は、このカメラ一体型ビデオテープレコーダ1全体の動作を制御するマイクロコンピュータで形成される。

【0032】すなわちシステム制御回路13は、このカメラ一体型ビデオテープレコーダ1に磁気テープ2及びメモリ16が装填され、このカメラ一体型ビデオテープレコーダ1が待機モードに設定されると、メモリ制御回路18を制御してメモリ16の管理用データを磁気テープ2のボリュームデータで書き換え、これによりメモリ16に磁気テープ2との対応関係を記録する。

【0033】さらにシステム制御回路13は、この状態でメモリ制御回路18を待機モードにセットし、デジタルビデオ信号DV1、デジタルオーディオ信号DAを順次循環的に第1の記録領域AR0に記録する。この状態でカメラマンが録画釦15を押圧操作すると、システム制御回路13は、このカメラ一体型ビデオテープレコーダ1全体の動作モードを記録モードに切り換え、順次入力されるデジタルビデオ信号DV1、デジタルオーディオ信号DAを磁気テープ2に記録すると共に、メモリ16へのデジタルビデオ信号DV1及びデジタルオーディオ信号DAの記録を停止する。

【0034】これに対応してメモリ制御回路18は、デジタルビデオ信号DV1及びデジタルオーディオ信号DAの記録を停止したアドレスデータADmに対して(図3)、アドレス値を値1だけ加算してアドレスデータADm+1(すなわち続く記録を開始する直前にあったメモリ16のアドレスデータであり、この記録領域AR0において最も古いビデオ信号DV1、オーディオ信号DAが記録されたアドレスデータでなる)を生成し、このアドレスデータADm+1を対応するシステムエリアに記録する。また同時にシステム制御回路13より出力されるインデックス信号ID0をこの対応するシステムエリアに記録し、続く待機状態を待ち受ける。

【0035】これに対応してシステム制御回路13は、磁気テープ2への記録を開始すると、このインデックス信号IDをメモリ16に出力し、またこのインデックス信号IDを記録増幅回路14、ロータリートランス7に出力し、これによりインデックス信号を有効に利用して、メモリ16に記録したデジタルビデオ信号DV1及びデジタルオーディオ信号DAと、続いて磁気テープ2に記録するデジタルビデオ信号DV1及びデジタルオーディオ信号DAとの対応関係を磁気テープ2及

びメモリ16に記録する。

【0036】さらにシステム制御回路13は、この状態でカメラマンが再び録画鈕15を押圧してカメラ一体型ビデオテープレコーダ1の動作モードが待機モードにセットされると、磁気テープ2への記録を停止すると共に、メモリ16の続く記録領域AR1にデジタルビデオ信号DV1、デジタルオーディオ信号DAの記録を開始する。これによりカメラ一体型ビデオテープレコーダ1においては、磁気テープ2に記録を開始する直前の、規定の時間だけ撮像結果をメモリ16に保持でき、機動性の劣化を有効に回避して、貴重な撮影の機会を逃すことなく記録することができる。さらにこのときインデックス信号IDを基準にして磁気テープ2及びメモリ16の対応関係を明確にしたことにより、編集等の作業において、このインデックス信号IDを基準にして対応するデジタルビデオ信号DV1及びデジタルオーディオ信号DAを連続して再生することができ、その分効率良く編集作業等の処理を実行することができる。

【0037】すなわち図5は、このカメラ一体型ビデオテープレコーダ1により記録した磁気テープ2を編集する編集システムのビデオテープレコーダを示すブロック図である。この編集システムは、磁気テープ2及びこの磁気テープ2に対応するメモリ16に記録したデジタルビデオ信号DV1及びデジタルオーディオ信号DAを、ビデオテープレコーダ20により再生して他のビデオテープレコーダに記録し直し、この他のビデオテープレコーダによりデジタルビデオ信号DV1及びデジタルオーディオ信号DAを編集する。

【0038】すなわちこのビデオテープレコーダ20において、再生増幅回路21は、回転ドラムに登録されて、磁気ヘッドより得られる再生信号を増幅してロータリートランス22に出力し、ロータリートランス22は、この再生信号を復調回路24に出力する。

【0039】復調回路24は、この再生信号を規定のタイミングで取り込んで2値化し、その結果得られるシリアルデータを復号して出力する。続く誤り訂正回路28は、この復調回路24の出力データを誤り訂正処理し、これによりデジタルオーディオ信号DA及びデジタルビデオ信号DV1を再生して出力する。デジタルアナログ変換回路(D/A)27は、順次入力されるデジタルオーディオ信号DAをデジタルアナログ変換処理し、これにより元のオーディオ信号SAを再生して出力する。

【0040】これに対して映像信号伸長回路29は、順次入力されるデジタルビデオ信号DV1をデータ伸長し、これによりデジタルビデオ信号DVを再生して出力する。

【0041】再生増幅回路30は、固定ヘッドより得られる磁気テープ2の再生信号を増幅して出力する。復調回路31は、この再生増幅回路30より出力される再生

信号を取り込んで2値化し、これによりインデックス信号IDを再生して出力する。また再生増幅回路30は、ロータリートランス22より出力される再生信号を規定のタイミングで取り込んで2値化し、これにより磁気テープ2に斜め記録したインデックス信号IDを再生して出力する。

【0042】これによりビデオテープレコーダ20では、早送り、巻き戻し等により磁気テープ2を頭出しする場合、磁気テープ2の長手方向に記録したインデックス信号IDにより、迅速に頭出し、また記録トラック単位で編集処理する場合等は、磁気テープ2に斜め記録したインデックス信号IDにより確実に処理できるようになされている。

【0043】この磁気テープ2に対する再生系に加えて、ビデオテープレコーダ20において、レート変換回路32は、再生時、メモリ16より出力される16ビットパラレルのデジタルビデオ信号及びデジタルオーディオ信号を元のビットパラレルのデータに変換して出力する。メモリ制御回路33は、メモリ16にアドレスデータ等を出力し、メモリ16の動作を制御する。

【0044】システム制御回路34は、このビデオテープレコーダ20全体の動作を制御するマイクロコンピュータで形成され、メモリ16より読み出したインデックス信号IDと、磁気テープ2より再生されたインデックス信号IDとを基準にして、メモリ16及び磁気テープ2からデジタルビデオ信号DV1及びデジタルオーディオ信号DAを順次映像信号伸長回路29及びデジタルアナログ変換回路27に出力することにより、インデックス信号IDにより対応関係を明示してメモリ16及び磁気テープ2に分割して記録したデジタルビデオ信号DV1及びデジタルオーディオ信号DAを連続して再生する。

【0045】すなわちシステム制御回路34は、始めに、メモリ16のシステムエリアより第1の記録領域AR0の先頭記録位置のアドレスデータAD、対応するインデックス信号IDを読み出す。続いてシステム制御回路34は、再生増幅回路30より得られるインデックス信号IDをモニタしながら、磁気テープ2を早送り、巻き戻し、第1の記録領域AR0に対応する記録開始位置に磁気テープ2を頭出しした後、磁気テープ2の走行を停止して再生待機状態に保持する。

【0046】続いてシステム制御回路34は、読み出しのコマンドと共にこのアドレスデータADをメモリ制御回路33に出力する。メモリ制御回路33は、これに反応して、このアドレスデータADで指定される記録開始位置から、順次アドレスデータを発行してメモリ16よりデジタルビデオ信号DV1及びデジタルオーディオ信号DAを読み出し、この読み出した信号DV1及びDAを映像信号伸長回路29及びデジタルアナログ変換回路27に出力する。これによりビデオテープレコー

ダ20では、メモリ16に記録したデジタルビデオ信号DV1、デジタルオーディオ信号DAをダビング用のビデオテープレコーダに出力する。

【0047】この状態でシステム制御回路34は、メモリ制御回路33の動作をモニタし、アドレスデータADの直前のアドレスにおいてメモリ制御回路33が読み出し動作を停止すると、磁気テープ2の待機状態を解除して磁気テープ2の再生を開始するように全体の動作を制御する。これによりビデオテープレコーダ20では、録画釦15を押圧する直前に記録したデジタルビデオ信号DV1及びデジタルオーディオ信号DAに続いて、続くデジタルビデオ信号DV1及びデジタルオーディオ信号DAをダビング用のビデオテープレコーダに出力する。

【0048】この状態でシステム制御回路34は、メモリ16のシステムエリアより続く記録領域AR1のインデックス信号ID、記録開始アドレスデータADをロードし、磁気テープ2において続く素材の記録開始位置になると、磁気テープ2を再生待機状態に切り換え、この記録開始アドレスデータADを基準にしてメモリ16から続くデジタルビデオ信号DV1及びデジタルオーディオ信号DAを読み出す。これによりビデオテープレコーダ20では、この一連の処理を繰り返して、磁気テープ2及びメモリ16に記録したデジタルビデオ信号DV1及びデジタルオーディオ信号DAを別途磁気テープに記録し直した後、従来と同様の処理手順により編集作業を実行できるようになされている。

【0049】以上の構成において、カメラ一体型ビデオテープレコーダ1(図1)において、カメラマンが待機状態にセットすると、被写体を撮像して得られるデジタルビデオ信号DVは、映像信号圧縮回路4においてほぼ1/10のデータ量に圧縮された後、デジタルオーディオ信号DAと共にレート変換回路17に入力され、ここで16ビットパラレルのデータに変換される。この16ビットパラレルのデータは、メモリ16のデータエリアに形成された規定の記録領域に順次循環的に記録され、これによりこの記録領域に最新のデジタルビデオ信号DV1及びデジタルオーディオ信号DAがこの記録領域のメモリ空間分、常に保持される。

【0050】この状態でカメラマンが録画釦15を押圧操作すると、メモリ16へのデジタルビデオ信号DV1及びデジタルオーディオ信号DAの書き込みが停止制御され、これにより録画釦15を押圧する直前のデジタルビデオ信号DV1及びデジタルオーディオ信号DAがメモリ16に保持される。同時に磁気テープ2による記録が開始され、デジタルビデオ信号DV1及びデジタルオーディオ信号DAは、誤り訂正符号付加回路5、変調回路6、ロータリートランス7、記録増幅回路8を介して磁気テープ2に斜め記録される。

【0051】これにより録画釦15を押圧した後のデ

ジタルビデオ信号DV1及びデジタルオーディオ信号DAが磁気テープ2に記録され、メモリ16及び磁気テープ2とで録画釦15を押圧する直前の規定期間より一連の被写体を撮像することができ、貴重な撮影機会を逃すことなく記録することができる。

【0052】このとき、システム制御回路13によりインデックス信号IDが出力され、またシステム制御回路13において、メモリ16の記録終了位置から、先頭記録位置のアドレスデータADが生成される。この先頭記録位置のアドレスデータAD及びインデックス信号IDは、メモリ16のシステムエリアに記録され、またこのインデックス信号IDは、磁気テープ2の記録開始位置、長手方向の延長する記録トラック及び斜め記録トラックに記録される。これにより磁気テープ2及びメモリ16の記録内容の関連がメモリ16及び磁気テープ2に記録され、またメモリ16の再生開始位置がメモリ16のシステムエリアに記録される。

【0053】これにより再生時、メモリ16に記録した先頭記録位置よりデジタルビデオ信号DV1及びデジタルオーディオ信号DAを再生した後、続いてインデックス信号IDを基準にして対応するデジタルビデオ信号DV1及びデジタルオーディオ信号DAを磁気テープ2より再生して、磁気テープ2及びメモリ16に分割して記録した一連の内容を記録順に再生することができる。

【0054】以上の構成によれば、待機状態において、メモリ16に順次循環的にデジタルビデオ信号DV1及びデジタルオーディオ信号DAを記録し、録画釦15が押圧されると、メモリ16の記録を停止すると共に、磁気テープ2にデジタルビデオ信号DV1及びデジタルオーディオ信号DAを記録することにより、録画釦15を押圧する直前のデジタルビデオ信号DV1及びデジタルオーディオ信号DAについても記録に残すことができる。これにより単にメモリカードを登載するだけで、貴重な撮影の機会を逃すことなく被写体を撮像することができ、その分カメラ一体型ビデオテープレコーダの機動性の劣化を有効に回避することができる。

【0055】このときインデックス信号を記録して、メモリ16及び磁気テープ2の内容を関連付けて記録したことにより、録画釦15の押圧操作を繰り返して多くの素材を磁気テープ2に記録した場合でも、この磁気テープ2に記録した素材に対して、メモリ16から対応するデジタルビデオ信号DV1及びデジタルオーディオ信号DAを確実に再生することができる。

【0056】なお上述の実施の形態においては、編集システムにおいて、デジタルビデオ信号DV1及びデジタルオーディオ信号DAを他のビデオテープレコーダにより記録し直して編集する場合について述べたが、本発明はこれに限らず、ハードディスク装置、光ディスク装置等に記録し直すようにしてもよい。またこれらの場

合に、システムエリアの内容、磁気テープに記録したインデックス信号を基準にして直接編集処理してもよい。

【0057】また上述の実施の形態においては、磁気テープ2及びメモリ16とで同一のインデックス信号を記録する場合について述べたが、本発明はこれに限らず、要は磁気テープ2及びメモリ16の記録内容について対応関係を把握できれば種々の識別信号を適用することができ、例えば磁気テープ2及びメモリ16で異なるインデックス信号を記録してもよい。またインデックス信号に代えて磁気テープ側に対応するシステムエリアの内容を記録して識別信号としてもよい。

【0058】さらに上述の実施の形態においては、磁気テープ及びメモリカードに撮像結果を記録する場合について述べたが、本発明はこれに限らず、例えば磁気テープのアンローディングに先立って、メモリ16の内容を磁気テープ2の規定領域に纏めて記録し直すことにより、撮像結果を磁気テープ2に纏めて記録することもできる。

【0059】また上述の実施の形態においては、記録媒体として磁気テープを用いる場合について述べたが、本発明はこれに限らず、記録媒体として磁気ディスクを用いる場合、さらには光ディスクを用いる場合等、種々の記録媒体を用いて映像信号を記録する場合に広く適用することができる。なおこれら磁気ディスク等の記録媒体を用いる場合に、メモリ16に代えて、これら記録媒体の規定領域を用いてもよい。

【0060】

【発明の効果】上述のように本発明によれば、待機状態において、規定の記憶手段に順次循環的に撮像結果を記録し、この待機状態が解除されると、記録媒体に撮像結

果の記録を開始すると共に、先の記憶手段への撮像結果の記録を終了することにより、単にこの記憶手段を設けるだけで、この待機状態が解除されると、直前の規定期間の撮像結果をこの記憶手段に保持することができる。これによりこの種の撮像装置の機動性の劣化を有効に回避して、貴重な撮影の機会を逃すことなく記録することができる。

【図面の簡単な説明】

【図1】本発明の実施の形態に係るカメラ一体型ビデオテープレコーダを示すブロック図である。

【図2】図1のカメラ一体型ビデオテープレコーダにおけるデジタルビデオ信号の処理の説明に供するブロック図である。

【図3】図1のカメラ一体型ビデオテープレコーダにおけるメモリの構成を示す略線図である。

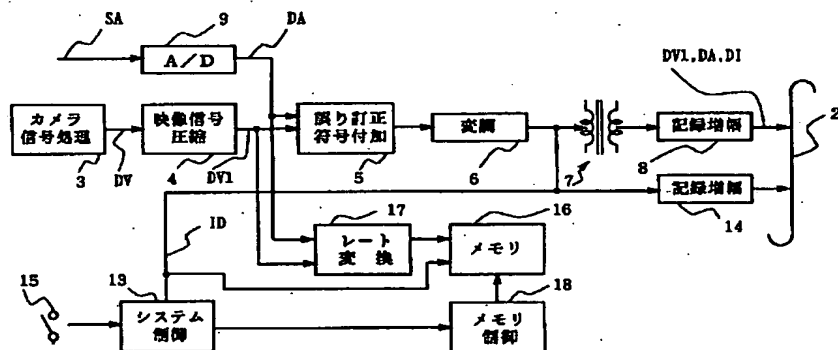
【図4】図1のカメラ一体型ビデオテープレコーダの動作の説明に供する略線図である。

【図5】図1のカメラ一体型ビデオテープレコーダにより記録された内容を編集するビデオテープレコーダを示すブロック図である。

【符号の説明】

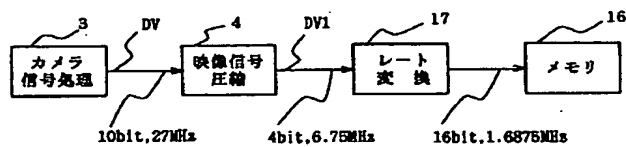
- | | |
|-------|------------------|
| 1 | カメラ一体型ビデオテープレコーダ |
| 2 | 磁気テープ |
| 4 | 映像信号圧縮回路 |
| 16 | メモリ |
| 17、32 | レート変換回路 |
| 18、33 | メモリ制御回路 |
| 13、34 | システム制御回路 |
| 29 | 映像信号伸長回路 |

【図1】

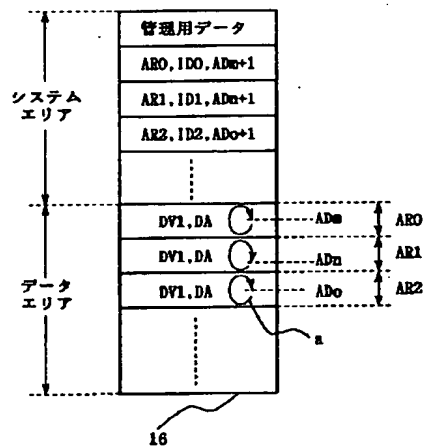


1: カメラ一体型ビデオテープレコーダ

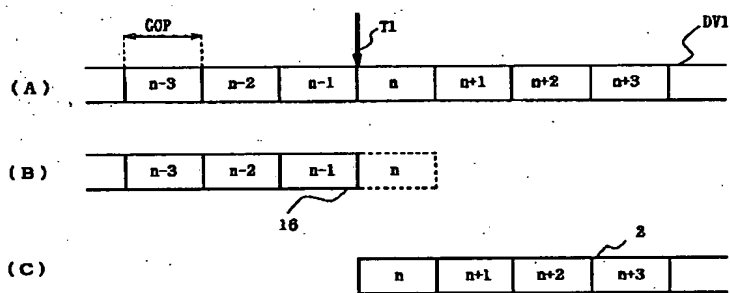
【図2】



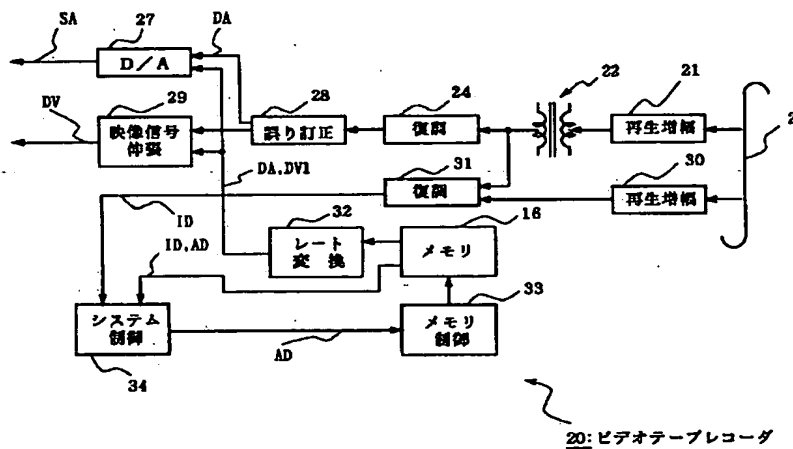
【図3】



【図4】



【図5】



20: ビデオテープレコーダ